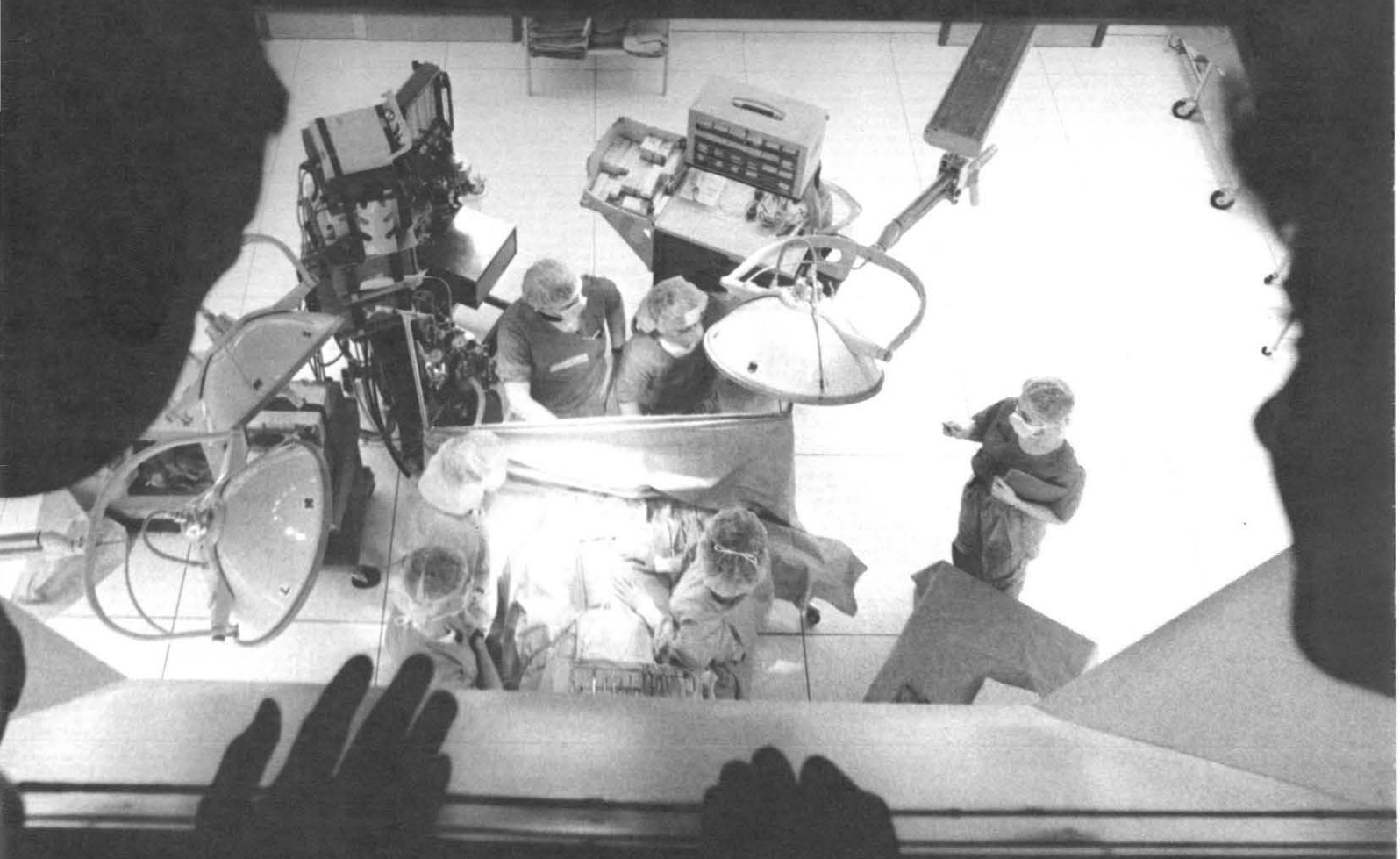
NAVY MEDICINE

May-June 1989



Inside Navy Medical Training

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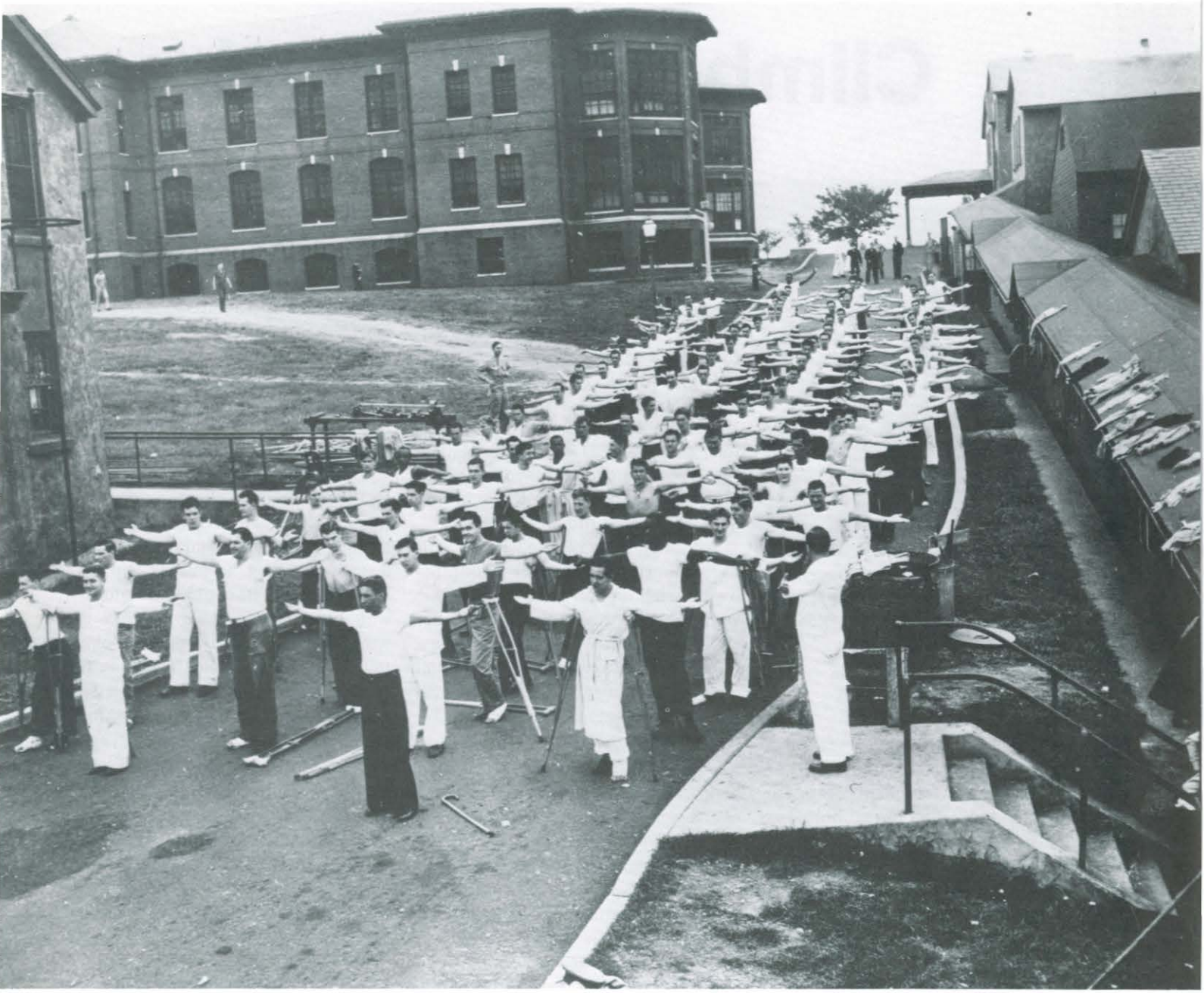
COVER: Operating room instructor, HM2 Sheri Craig of the Naval School of Health Sciences, teaches operating procedure to students at Naval Hospital, Bethesda, MD. Other students observe through the OR's spectator dome. Photo by HM2 Louis E. Curtis, Jr., NSHS, Bethesda, MD.

A look back: Navy medicine ca. 1945



NAVMEDCOM Archives

Chelsea morning wakeup, USNH Chelsea, MA

Navy Docs to Climb Mt. Everest

Planning procedures before the climb, CDR Butler (left) and CDR Harris view slides of the retina in preparation for their data-collecting.

Many claim past researchers have moved mountains for the advancement of modern medicine, but two ophthalmologists from the National Naval Medical Center (NNMC), Bethesda, plan to climb the greatest mountain of the world to conduct some breathtaking research of their own.

In April CDR Frank Butler, Jr., MC, and CDR David Harris, Jr., MC, will set out for Mt. Everest to research the cause, incidence, and residual effect of high altitude retinal hemorrhages and other aspects of acute high altitude sickness.

They plan not only to conduct eye examinations before the trip and afterwards but will perform numerous exams on a group of 14 climbers while at Everest. The climbers will make several partial journeys toward the Everest summit where altitude has been found to cause the detrimental conditions associated with the sickness.

High altitude retinal hemorrhages are part of a spectrum of diseases known collectively as acute high altitude sickness. CDR Butler explained that the sickness can encompass the potentially fatal cerebral edema and high altitude pulmonary edema.

Although most people who get retinal hemorrhages recover spontaneously without permanent damage, some do suffer residual defects, Butler explained. Today, there seems to be a move to investigating these residual effects, particularly those related to proper functioning of the brain.

"There is a great deal of interest in this because it may be possible that people who climb mountains often over a period of time may have chronic progressive brain damage," Harris said, explaining that while the brain of a living person under altitude stress cannot be examined, the retina, which is part of the brain, can be helpful in finding some answers.

"The eye is like a window to the brain. By examining the retina and damage we may be able to infer the nature of the damage and the brain damage that may possibly occur with altitude stress at altitude excursions," he said.

Understanding the high altitude phenomenon is of operational interest to the Navy, Butler pointed out, because a number of Navy and Marine Corps units have a mountain warfare mission and operate in the mountains where they would possibly be susceptible to the diseases.

The complications associated with high altitude sickness are encountered by people who make sudden ascents in excess of approximately 10,000 feet, according to Butler. Yet he, Harris, and their group of climbers, while attempting to reach personal maximum altitudes, may go as far up as 23,000 feet during the 4- to 6-week trip.

To start off the ophthalmologists will join climbers from all over the world and fly in a single-engine plane to a little village called Lukla in the foothills of Everest. They then will walk for the next 8 days, escalating from an altitude of 9,000 to 18,000 feet. Although the climbers will be on foot, yaks from the Lukla villagers—the Sherpas—will be used to haul heavier equipment to the base camp.

The base camp, at 18,000 feet, will mark the spot for the majority of research to take place in the form of eye examinations, retinal photography, and the monitoring of activity levels and oxygen dependency.

Butler and Harris plan to keep careful tabs on each other and fellow climbers as each make successive treks toward Everest's summit of 29,028 feet.

"The climbers will be making multi-

ple, partial hikes up to the summit from the base camp and we'll know what their approximate altitude exposure will be at a given amount of time. We're going to examine climbers in the late afternoon and evenings to minimize their discomfort from the glare on the glacier fields," Butler said.

Initial comprehensive eye examinations have already been performed on the climbers at NNMC and they will have many more exams before their venture will end. The physicians said they also will take as many retinal photographs as possible while on the trip. But the seemingly basic procedures could be pretty tricky to carry out at 18,000 feet.

The extreme altitudes previously have caused roadblocks for the very few who have taken on this assignment. The altitude, according to Butler, could be the most problematic aspects of the climb in that it can impair judgment and slow down the motor skills necessary for taking retinal photographs with a fundus camera—an instrument designed for photographing the retina.

"People who have previously tried to take these pictures at altitude have noted that their ability to do the research has been impaired. Just taking pictures, focusing the cameras and examining the eye is more difficult," Butler said.

However, the ophthalmologists have confidence in their ability to carry out the research. Realizing that these subtle effects on judgment have restricted past data collectors and even have killed mountain climbers over the years, they have consulted others who have done similar research, outlined goals in terms of their own study, and started getting in good physical condition for the excursion.

The commanders presently run up 19 flights of stairs 10 times in succession twice a week in the Tower Building at NNMC to prepare for Everest. Although they claim the incidence of high altitude sickness is not related to physical shape and does strike randomly, they're taking precautionary measures to be on the safe side.

Some of these measures will include: taking a medication, Diamox, commonly used to combat the effects of the high altitude sickness, following a 7,000-calorie diet during the trip to fight heat loss and, of course, dressing warmly in multiple layers of clothing to combat the fierce cold and winds. Butler said temperatures could go as low as 40° below zero with winds up to 100 knots at the peak of Everest.

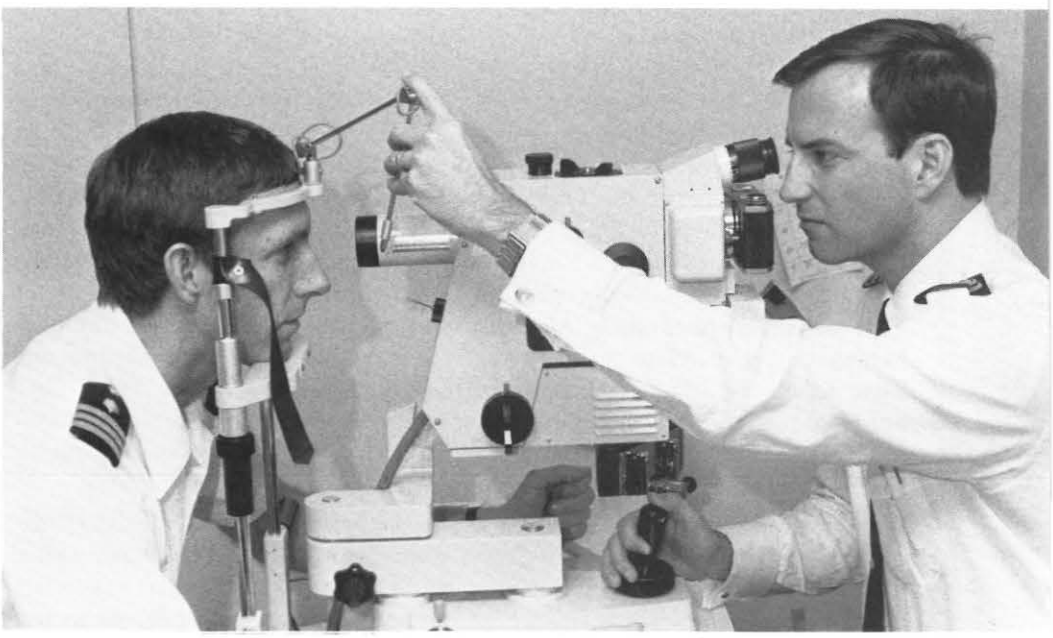
Since there will be two of them working at Everest they have a much greater chance of collecting data because beginning signs of the sickness can be detected and cured by returning to a low altitude, Harris pointed out. So if he or Butler become ill, one will be able to complete the necessary research.

The two have no real worries about the trip and expect no major setbacks in their work. They were selected for the project because of their work at NNMC and for their list of accomplishments.

CDR Butler, chief resident ophthalmologist, has been with NNMC for 3 years. He did undergraduate work at Georgia Institute of Technology and spent 4 years as a SEAL platoon commander in Underwater Demolition Team 12 and SEAL Team 1 in California. He was president of Alpha Omega Alpha at the Medical College of Georgia and did an internship in family practice at Naval Hospital, Jacksonville, FL. He was trained as an undersea medical officer and for 5 years conducted experimental diving research at the experimental diving unit in Panama City, FL.

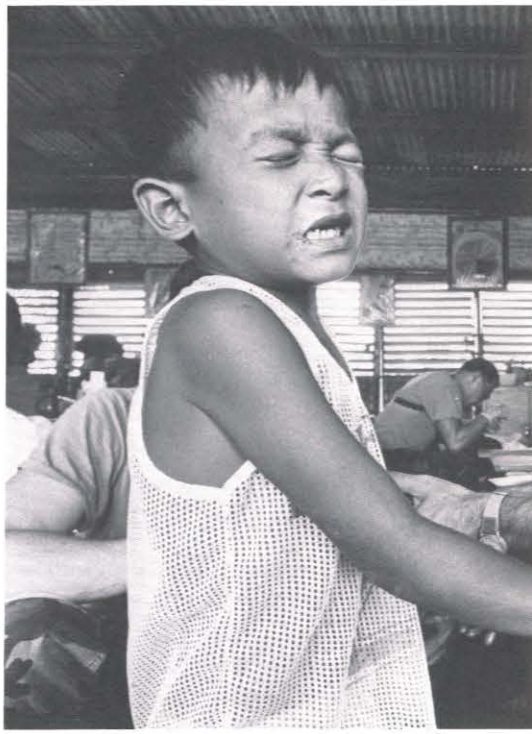
CDR Harris, staff ophthalmologist, was born at Bethesda Naval Hospital and grew up in Tennessee where he attended the University of Tennessee and continued with medical school at the University of Tennessee's Health Center for the Health Sciences. There Harris was president of his medical school class and an Alpha Omega Alpha member. He interned at NNMC in internal medicine and was a medical officer for USS *El Paso* (LKA-117) for 2 years. Harris did his ophthalmology residency at NNMC and also a fellowship in corneal and external disease at Emory University in Atlanta, GA. He has served as the director of the cornea service at NNMC since 1977. □

—Story by Kerry A. Gildea, Public Affairs Office, NNMC, Bethesda, MD. Photos by HM2 Dan Kelly.



The two ophthalmologists examine each other's eyes and take some before-the-trip photos to compare with retina photographs yet to come from Mt. Everest.

Military Medicine in Action



A 16-member contingent from U.S. Naval Hospital, Subic Bay joined forces recently with American Army medics from the 1st Battalion, 1st Special Forces Group (Airborne) to conduct a series of MEDCAP's (Medical Civil Action Programs) in remote areas of Nueva Ecija Province in the Republic of the Philippines. The Armed Forces of the Philippines (AFP) also provided a 15-man medical/dental team, and they worked alongside their American counterparts for the duration of the operation.

Nueva Ecija is on the main island of Luzon, along the central rice plain, and is approximately 80 miles northeast of Manila.

The U.S. and AFP medical teams operated out of Fort Ramon Magsaysay, which is one of the primary AFP training bases. It is also home for Philippine Scout Rangers, Special Forces, and Airborne troops.

MEDCAP sites for the operation were the barangays (villages) of Rio Chico, Soledad, and Calikid Norte, all located within 7-10 kilometers of the Fort Magsaysay reservation. All three barangays are in relatively impoverished areas, and local inhabitants do not have ready access to medical and dental care. None of the sites had been visited by a MEDCAP before, and the residents responded enthusiastically.

It was also a good opportunity for American medical personnel to evaluate medical problems which are rare in the continental United States but particularly prevalent in tropical and Third World nations, such as tuberculosis, malaria, leptospirosis, and iodine and vitamin deficiencies.

A 3-day MEDCAP was held in each barangay, and patients were treated for a wide variety of medical conditions. The language barrier was not a major problem. In addition to interpreters provided by the AFP and Provincial Health Office, four corpsmen from the Navy contingent were native Filipinos fluent in various regional dialects.

By the end of the operation, more than 9,700 patients had received treatment. "It was very gratifying to be able to make such a positive contribution to these peoples' lives," said LCDR Chris Daniel, MC, USNR, "as well as to our mutual relations and friendship. It also enhanced my ever-broadening knowledge of Filipiniana."

Preventive medicine support was provided by HM1 Jim Howes, who also served as leading petty officer of the Navy contingent. In addition to assisting with and supervising MEDCAP's, he also conducted numerous preventive medicine surveys throughout the area, trained Army personnel in field sanitation measures, and provided guidance on sanitation problems in the barangays visited. "We didn't eradicate diseases in each barangay," Howes noted, "but I know we made an impact."

Philippine Provincial Health Office officials also provided assistance at the MEDCAP's, and patients with chronic illnesses were referred to the province hospital in Cabanatuan City. Several patients requiring surgical intervention were accepted as civilian-humanitarian cases by U.S. Naval Hospital, Subic Bay.

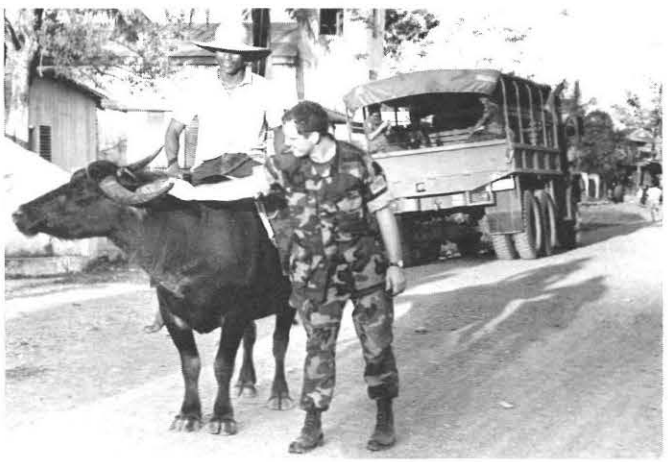
American and Filipino dentists were also kept extremely busy, and at the end of the operation had extracted 3,551 teeth. Dental hygiene kits were also made available to schoolchildren throughout the area.

Philippine Army troops provided site security for the MEDCAP's, while crowd control and liaison with local officials was shared by American and Filipino Civil Affairs personnel.

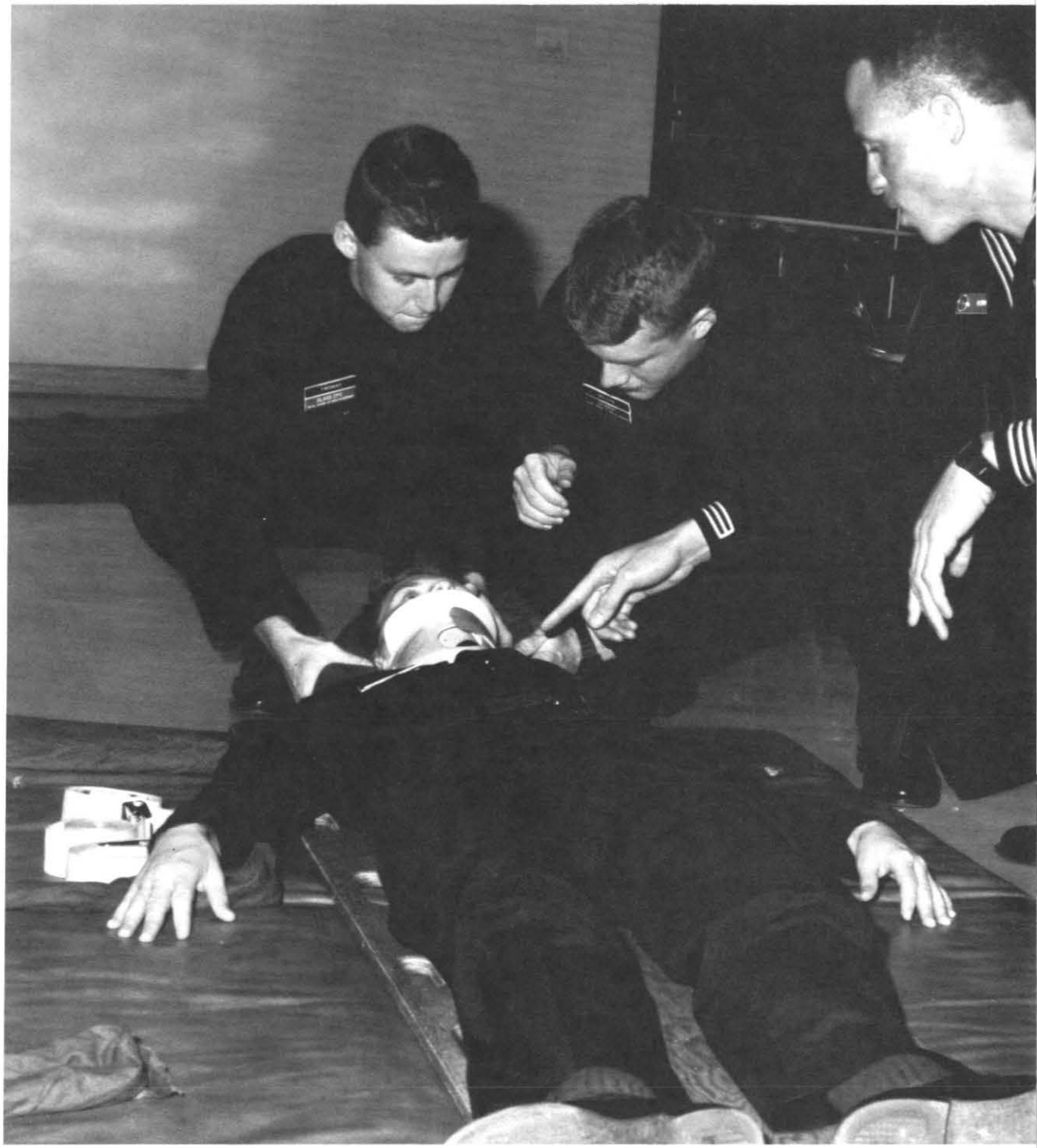
LCDR William Robinson, senior Navy physician for the operation, said he thought the MEDCAP's had been a resounding success, and felt that "some of the patients treated will come away with their lives improved for extended periods of time."

Virtually all Navy personnel participating had high words of praise for their U.S. Army counterparts. "Special Forces are a great bunch of people," said HM3 Denise Wilder, "and I consider it a privilege to have worked and learned with them. □

—Story by LCDR Frank C. Brown, MSC, U.S. Naval Hospital, Subic Bay. Photos by PH1 Ted Salois.



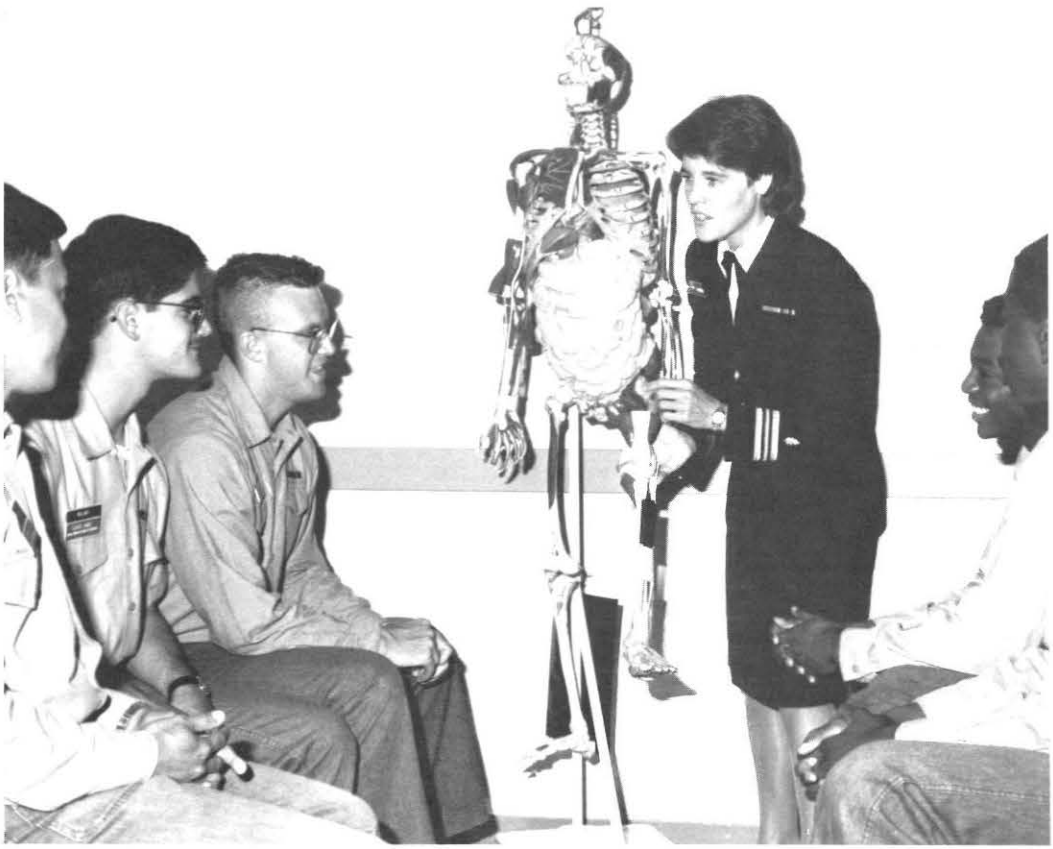
Clockwise from top left: **Filipino boy cringes as LCDR William Robinson checks for an arm fracture; Petty Officer Eric Tonnaer carries a woman after she collapsed while waiting in line for medical care. Some villagers waited hours in the hot sun for treatment; Hospital Corpsman Joseph Tremblay (right) prepares to pull a tooth from a young Filipino boy while Medic James Costello and Dental Technician Esperanza Diaz lend a hand; a young girl gets a shot of lidocaine before having a tooth extracted; Petty Officer Stuart Souders makes friends in the village of Rio Chico; and Philippine soldiers provide security at the MEDCAP's three sites. One of the MEDCAP's objectives was to build trust by showing U.S. and Philippine government support for the people at the "rice roots" level.**



We Teach Caring

CAPT Vernon D. Schinski, MSC, USN

Students learn casualty care and anatomy at the Naval Hospital Corps School, San Diego, CA.



Photos by HMC Mason Johnson

Following the theme of a Hospital Corps School instructor the Naval Health Sciences Education and Training Command (HSETC) has adopted "We Teach Caring" as its motto. As the young corpsman was trying to explain to his graduating class, we not only want to teach students to *care for* their patients, but to *care about* their patients, their profession, and the Navy Medical Department.

Whether we enter our health profession because we care, or we learn to care because of our profession, there are few other callings in which you will find a similar level of dedication. You can be assured that you will find that dedication abundantly evident in the staffs of our medical education and training activities.

Our mission, as the echelon 3 command for medical education, is to implement and manage education and training programs for the Medical Department. While this mission is simply stated, individuals generally

TABLE 1
HSETC Schoolhouse Activities

Naval Hospital Corps School, Great Lakes, IL
- 14-week basic Hospital Corps "A" school

Fleet Hospital Operations and Training Command, Camp Pendleton, CA
- Upgraded to command February 1989
- Trains active duty and reserve personnel in the operation of the containerized fleet hospital system

Naval School of Health Sciences, Bethesda, MD
- Officer management and professional development courses
- Variety of technical "C" schools
- Oversight of five detachments

Naval School of Health Sciences Detachment, Portsmouth, VA
- Variety of technical "C" schools
- Indoctrination of medical officers going to sea
- Refresher training for independent duty corpsmen

Naval Undersea Medical Institute, Groton, CT
- Trains medical officers and independent duty corpsmen for duty in the submarine service and diving

Naval School of Health Sciences Detachment, Ft Sam Houston, TX
- Oversight of Navy students and instructors assigned to Army Academy of Health Sciences in joint training

Naval School of Health Sciences Detachment, Denver, CO
- Oversight of Navy students and instructors assigned to joint medical repair school training

Tropical Medicine Detachment, Puerto Rico
- To move from Panama to Puerto Rico June 1989
- Field and laboratory-based course in tropical medicine

Naval School of Health Sciences, San Diego, CA
- Basic Hospital Corps "A" school
- Variety of technical "C" schools
- Medical officer indoctrination for sea duty
- Physician assistant training begins August 1989
- Oversight of two detachments

Naval School of Health Sciences Detachment, Oakland, CA
- Variety of technical "C" schools

Naval School of Dental Assisting and Technology, San Diego, CA
- Basic dental technician "A" school
- Variety of dental technical "C" schools

express amazement when introduced to the breadth and depth of our involvement. With about 900 assigned instructors and staff in 11 schoolhouses (Table 1) and the headquarters command, we annually train over 18,000 Medical Department personnel. This could not be accomplished without the superb cooperation of countless additional duty instructors who provide formal lectures or practical experiences in locations throughout the Medical Department.

HSETC training encompasses a broad spectrum of programs:

- Basic "A" school for hospital corpsmen and dental technicians.
- Technical "C" schools in 41 areas of specialization (Table 2).
- Indoctrination and refresher training.
- Professional courses for all corps officers.
- Operational and management courses (Table 3).
- Continuing Medical Education and professional update training.
- Full-time outservice education at levels from the bachelors to postdoctoral subspecialization.
- Assistance to medical commands in

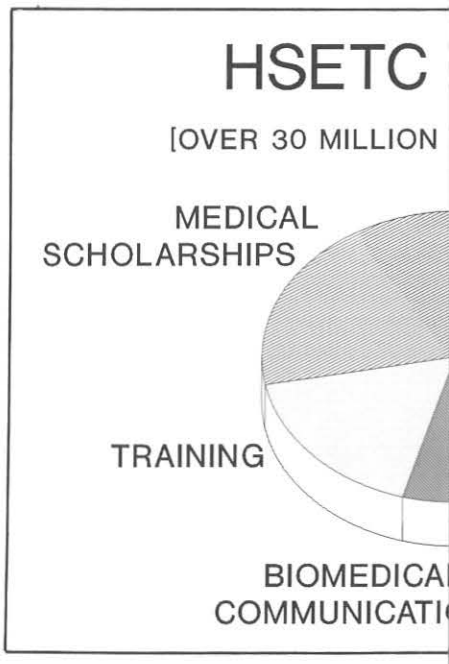


Figure 1

the organization and content of command training programs.

In addition to providing guidance and oversight for the schoolhouse activities, HSETC performs a wide variety of training functions throughout Navy medicine managing a budget in excess of 30 million dollars annually (Figure 1). These functions may be best summarized by describing the duties of five functional units.

The Program Management Directorate, which maintains divisions for each corps, the Reserves, and cross-corps training, is responsible for the "people-side" of our training programs. They maintain a close liaison with corps directors and career planners, assist with student selection, and communicate with students active in training programs.

The Academic Affairs Directorate is responsible for the content of training programs. They help to establish Navy needs and credentialing requirements, work with subject-matter experts and instructors to develop curricula, and evaluate curricula in the schools and the student product in the workplace. They are charged with a full verification of each of the enlisted curricula at

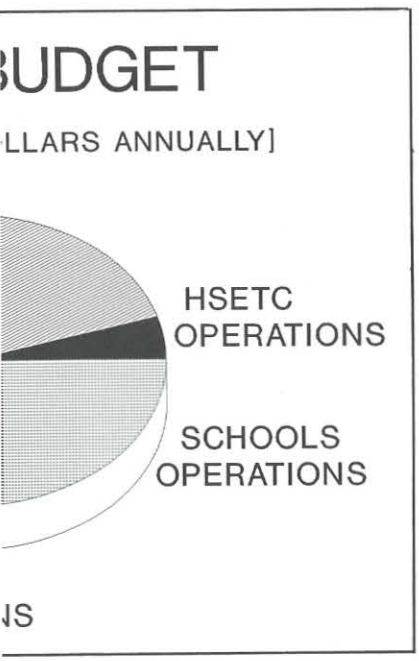


TABLE 2
HSETC Enlisted Training Programs

NEC	Title
HM-0000	General Duty Hospital Corpsman
HM-8294	Search and Rescue Technician
HM-8402	Nuclear Submarine Medicine Technician
HM-8404	Field Medical/Dental Technician (HM)
HM-8405	Paramedic (new NEC under development)
HM-8406	Aerospace Medicine Technician
HM-8407	Radiation Health Technician
HM-8408	Cardiopulmonary Technician
HM-8409	Aerospace Physiology Technician
HM-8416	Clinical Nuclear Medicine Technician
HM-8425	Independent Duty Technician
HM-8432	Preventive Medicine Technician
HM-8433	Transplantation Technician
HM-8445	Ocular Technician
HM-8446	Otolaryngology Technician
HM-8451	X-ray Technician, Basic
HM-8452	X-ray Technician, Advanced
HM-8454	Electroencephalography Technician
HM-8463	Optician
HM-8466	Physical Therapy Technician
HM-8472	Medical Photography Technician
HM-8478	Biomedical Repair Technician, Advanced
HM-8479	Biomedical Repair Technician, Basic
HM-8482	Pharmacy Technician
HM-8483	Operating Room Technician
HM-8485	Psychiatry Technician
HM-8486	Urology Technician
HM-8489	Orthopedic Castroom Technician
HM-8492	Special Operations Technician
HM-8493	Medical Deep Sea Diving Technician
HM-8495	Dermatology Technician
HM-8501	Medical Laboratory Technician, Basic
HM-8503	Histology Technician
HM-8506	Medical Laboratory Technician, Advanced
HM-8541	Respiratory Technician
DT-0000	Basic Dental Assistant
DT-8703	Dental Administrative Technician
DT-8707	Field Medical/Dental Technician (DT)
DT-8732	Dental Repair Technician
DT-8752	Prosthetic Laboratory Technician, Basic
DT-8753	Prosthetic Laboratory Technician, Advanced
DT-8765	Maxillofacial Technician

least every 3 years and have recently begun indepth reviews of all officer programs. If we want to train a new dialysis technician, begin training advanced care technicians, or reestablish the Physician's Assistant Training Program, these are the people who make it happen.

The Biomedical Communications Directorate oversees the consolidated audio/video program for the Medical Department. They provide medical photographic and graphic arts support; develop films, videos, and Computer Assisted Medical Interactive-video Systems (CAMIS); and oversee audio/video libraries and 19 Biomedical Communications Centers throughout the Medical Department. Currently, they are actively involved in evaluating state-of-the-art teleconferencing capabilities for the Medical Department.

The Armed Forces Health Professions Scholarship Program in the Resources Management Directorate functions to provide medical school scholarships and medical student oversight for some 1,100 students currently being trained under Navy scholarships in over 60 medical schools nationwide.

The Clinical Investigation Program is responsible for medical research and studies performed in the clinical setting. This program supports research required in Graduate Medical Education, and helps to provide an atmosphere of inquiry that will keep Navy providers at the cutting edge of medical knowledge.

Some major projects of interest ongoing at HSETC include:

- Reestablishment of the Physician's Assistant Training Program.
- Development of an Advanced Management Development Course for CO's, XO's, and OIC's.
- Development of a system to provide associates' degrees for credits earned in Navy schools and civilian colleges.
- Development of a Surface Warfare Medical Institute.
- Expanded use of CAMIS interactive videos for Continuing Medical Education credits.
- Development of a Logistics Management Training Program.
- Development of an Advanced Care Technician Program to formally identify senior corpsmen in the patient care setting and to provide upward mobility in patient care.
- Development of increased programs and training tools for training medical reservists.
- Provision of mechanisms for teleconferencing within the Medical Department for use in command and control as well as education.

Individuals with interest in additional information about the general Medical Department Education and Training Program under HSETC might wish to request a copy of the *HSETC Fact Book,* available upon request from the Office of the Commanding Officer, Naval Health Sciences Education and Training Command, Bethesda, MD 20814-5022. Others with interest in specific programs will find considerable information available on the *HSETC bulletin board,* which can be reached by computer modem at Commerical (301) 295-3917 or Autovon 295-3917. □

TABLE 3
HSETC Operational and Management Courses

Operational and Readiness Courses
- Combat Casualty Care Course (C4)
- Combat Casualty Management Course (C4A)
- Mobile Medical Augmentation Team Training (MMART)
- Rapidly Deployable Medical Facility Training (RDMF)
- Fleet Hospital Operations Course
- Medical Readiness Planners Course
- Medical Regulating Course
- Medicine in the Tropics
- Medical Effects of Nuclear Weapons
- Treatment of Chemical Casualties Course
- Cold Weather Medicine Training
- Strategic Medical Readiness & Contingency Course

Management and Professional Training
- Leadership Management Education & Training
  - Intermediate (ILMET)
  - Senior (SLMET)
  - Command (CLMET)
- Management Development Course
- Interagency Institute for Federal Health Care Executives
- Prospective Commanding Officers Shore Station Management
- Executive Training Program Manpower Management
- Health Resources Management Course
- Quality Assurance/Risk Management Course
- Financial and Supply Management Course
- Patient Administration Course
- Nurse Anesthesia Training Program
- Nurse Peri-Operative Course
- Army/Baylor Health Care Administration Course
- Designing Effective Medical Education Programs

CAPT Schinski is commanding officer of the Health Sciences Education and Training Command, Bethesda, MD 20814-5022.

The Navy's Central Medical Library

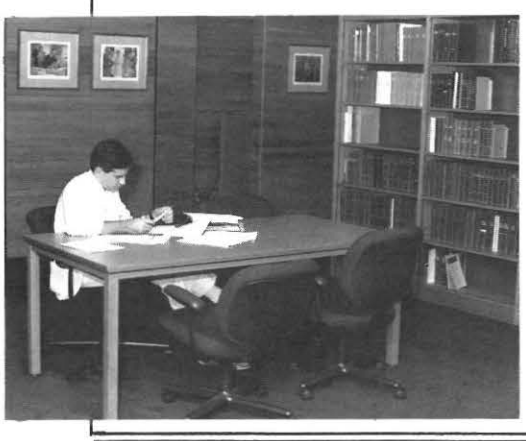
87 Years Young and Still Serving

Reference librarian, Cindy Brancato, provides literature search services for Navy Medical Department personnel worldwide.

In 1902 U.S. Navy Surgeon General Presley Rixey requested that LT Edward Rhodes Stitt develop a library to serve the Navy Medical Department. Dr. Stitt, a scholar who published extensively in parasitology and tropical medicine, acquired a broad-based collection of classical and then current medical and scientific texts as well as journals. Dr. Stitt served the Navy as Surgeon General during the years 1920-1928 and was memorialized in 1949 for his myriad contributions to Navy medicine when the library he developed was designated the Edward Rhodes Stitt Library.

The library was moved from downtown Washington, DC, in the early 1940's to the National Naval Medical Center at Bethesda, MD, into 5,000 square feet of space. Having outgrown that space by the late 1960's, the library moved into its present 15,000 square feet in December 1983.

The library now seats 120 users and consists of approximately 70,000 bound volumes, 670 journal subscriptions, a 3,000-volume History of Medicine collection including books published in the 16th, 17th, and 18th centuries, a collection of some 900 videocassettes, at least 11 audiocassette titles, the Ciba 35 mm slide set, a pastoral care book collection, and a hospital administration collection of book and journal titles. The earliest journal title holding dates back to 1827.



For personnel at Bethesda, library services include literature search of the Medline database and some 200 databases of BRS, availability of Medline on CD-ROM for individual users to do their own searches, and availability of copy machines.

For Navy Medical Department personnel worldwide, literature search service is available by telephoning Cindy Brancato or Jean Conner at Commercial (202) 295-1185, Autovon 295-1185 or write: Edward Rhodes Stitt Library, National Naval Medical Center, Bethesda, MD 20814-5000.

Copies of journal references can be requested by mail or telefax: Commercial (202) 295-5384, Autovon 295-5384, Telefax (301) 295-5389.

Hospital Corpsmen Will Be Even Better

LCDR C.M. Bruzek-Kohler, NC, USN
CAPT V.D. Schinski, MSC, USN

Navy hospital corpsmen have a long tradition of being among the very best, but the new corpsman will have 40 percent more training and be even better. On 3 Jan 1989 the new 14-week Hospital Corps "A" School curriculum was implemented at Naval Hospital Corps School, Great Lakes, IL, and Naval School of Health Sciences, San Diego, CA. This marks the beginning of a new level of basic training for our Medical Department hospital corpsmen. In April the first graduates of this improved training program entered our treatment facilities, the fleet, and the Fleet Marine Force.

The goal of enlisted training in the Navy Medical Department was set forth in 1987 as the Surgeon General's Philosophy of Enlisted Education. This philosophy calls for enlisted personnel to be fully prepared for their peacetime and contingency roles.

Hospital Corps School provides entry level competencies in the knowledge, cognitive skills, attitudes, and task performance capabilities required for the delivery of quality health care. To meet these requirements the Naval Health Sciences Education and Training Command (HSETC) was tasked to develop a more comprehensive basic training program.

The "A" School Conference held in Portsmouth, VA, in January 1988 brought together subject-matter experts from medical treatment facilities, training facilities, and the operational forces to determine the training requirements of entry level hospital corpsmen. These training requirements include not only skill performance, but an increased emphasis on the

TABLE 1
Synopsis of Formal School Training

Roles and Fundamentals:
- Provides an introduction to the Navy Medical Department.
- Explains the role of the Medical Department and the hospital corpsman in both peacetime and wartime Navy and Marine Corps operations.
- Provides training in basic anatomy and physiology, medical terminology, medical math, patient-corpsman communication and relationship skills, and medical ethics.
- Provides a platform for evaluation of the student's "bedside manner."

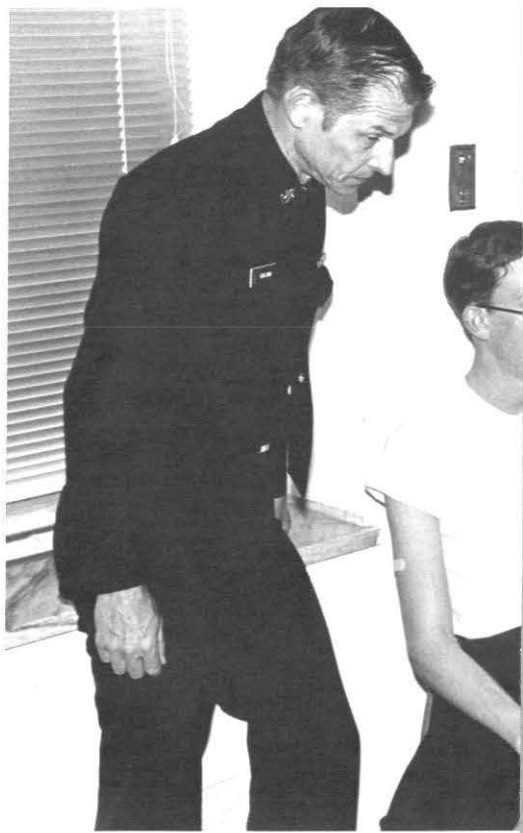
Emergency Care:
- Provides the basic emergency medical care application of Navy-specific medical equipment in the military environment.
- Prepares student to recognize and respond to emergency medical conditions and to perform initial emergency care and patient stabilization in civilian and military emergencies.

The content in this area is not intended to produce an EMT-A, nor is it geared to preparing students for the EMT-A certification examination.

Patient Care:
- Provides basic ward administration from patient admission to discharge.
- Teaches basic pharmacology and toxicology, medication administration, specimen collection, and all other routine nursing procedures.

HM2 Carl Bishop ensures that student sets the correct drip factor for IV.

LT Soren Christiansen, NC, instructs student in proper handling of TUBEX syringe. *Bottom:* HMCS Warren Bohlman reviews proper site selection with students before administration of a subcutaneous injection.



knowledge and attitudes necessary to perform competently the skills as well. Both school sites were then tasked to develop a sound curriculum which blends those requirements into classroom and laboratory experiences.

The revised formal school program, approved by HSETC, places increased emphasis on comprehension and understanding, while maintaining competencies in hands-on critical skills. The new curriculum focuses more at the Junior College level of education, where students learn to apply basic knowledge, attitudes, and skills, as apposed to learning just a series of tasks that can be used in the treatment facility and operational environments.

Basic knowledge includes an understanding of the:

- Mission, function, and structure of the Medical Department.
- Role of the hospital corpsman, both in medical treatment facilities and with the operational forces.
- Importance of medical ethics and the standards of conduct expected of the hospital corpsman.
- Fundamental cognitive areas such as basic anatomy and physiology, mathematics, medical terminology, and pharmacology.

Attitudes include the application of principles and concepts of:

- Medical ethics.
- Quality patient care.
- Interpersonal relations.
- Professional conduct ("Pride and Professionalism").

Basic skills include the application and understanding of:

- Emergency care procedures, including use of military-specific equipment.
- Patient care procedures, including documentation.
- Basic administrative processes.

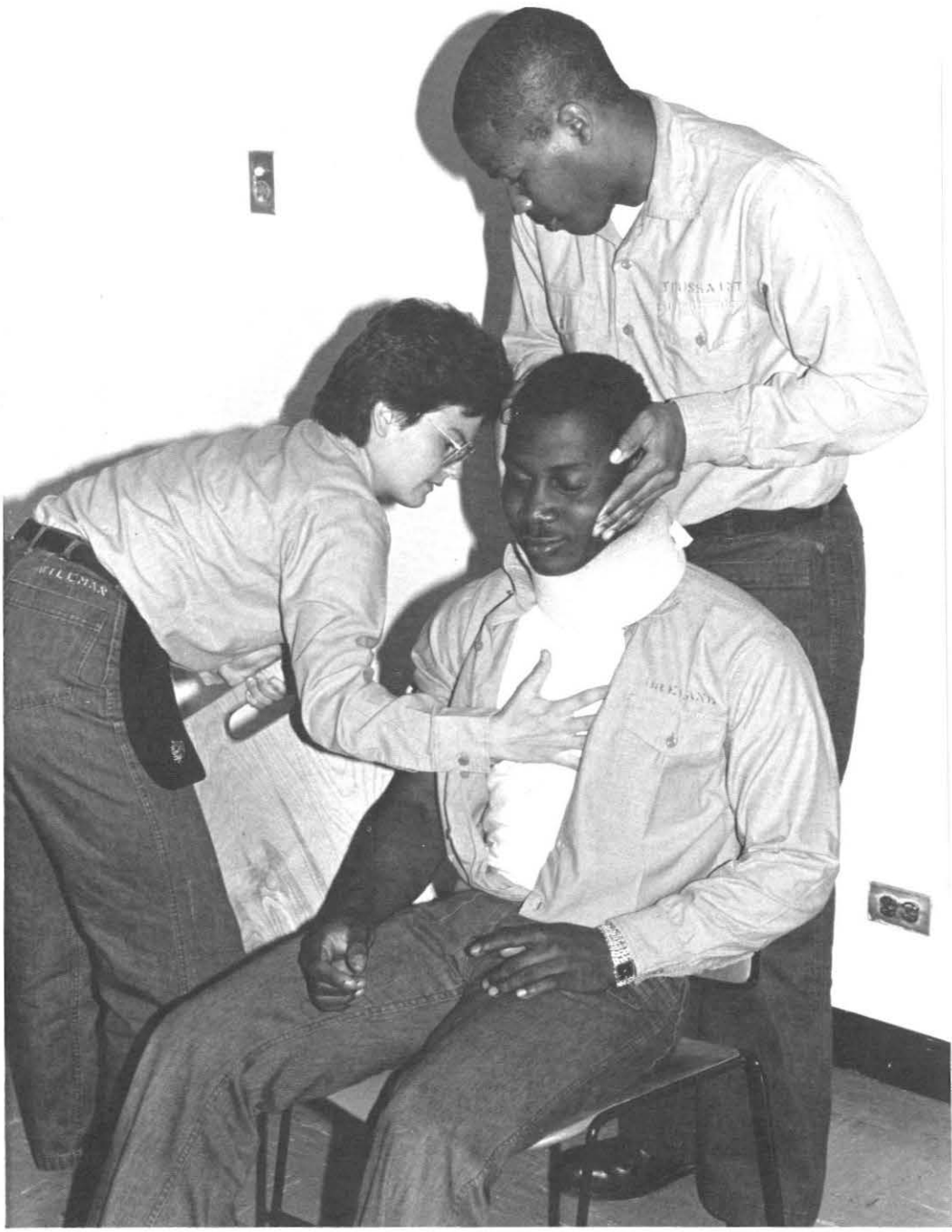
The formal school curriculum is structured to present the fundamentals first, then build on those basics to reinforce initial learning and help students to integrate their knowledge. Real-world examples and problem-solving exercises are used throughout the curriculum to illustrate concepts and to help students develop the thinking skills they need as corpsmen. A synopsis of the formal school training is provided in Table 1.

One of the most important changes in the program is the shift from a task-based to a competency-based curriculum. "Competency" is derived from the interaction of the skills, knowledge, and attitudes required to perform successfully. Thus, competency in a particular job requires more than just the ability to perform the tasks specific to that job.

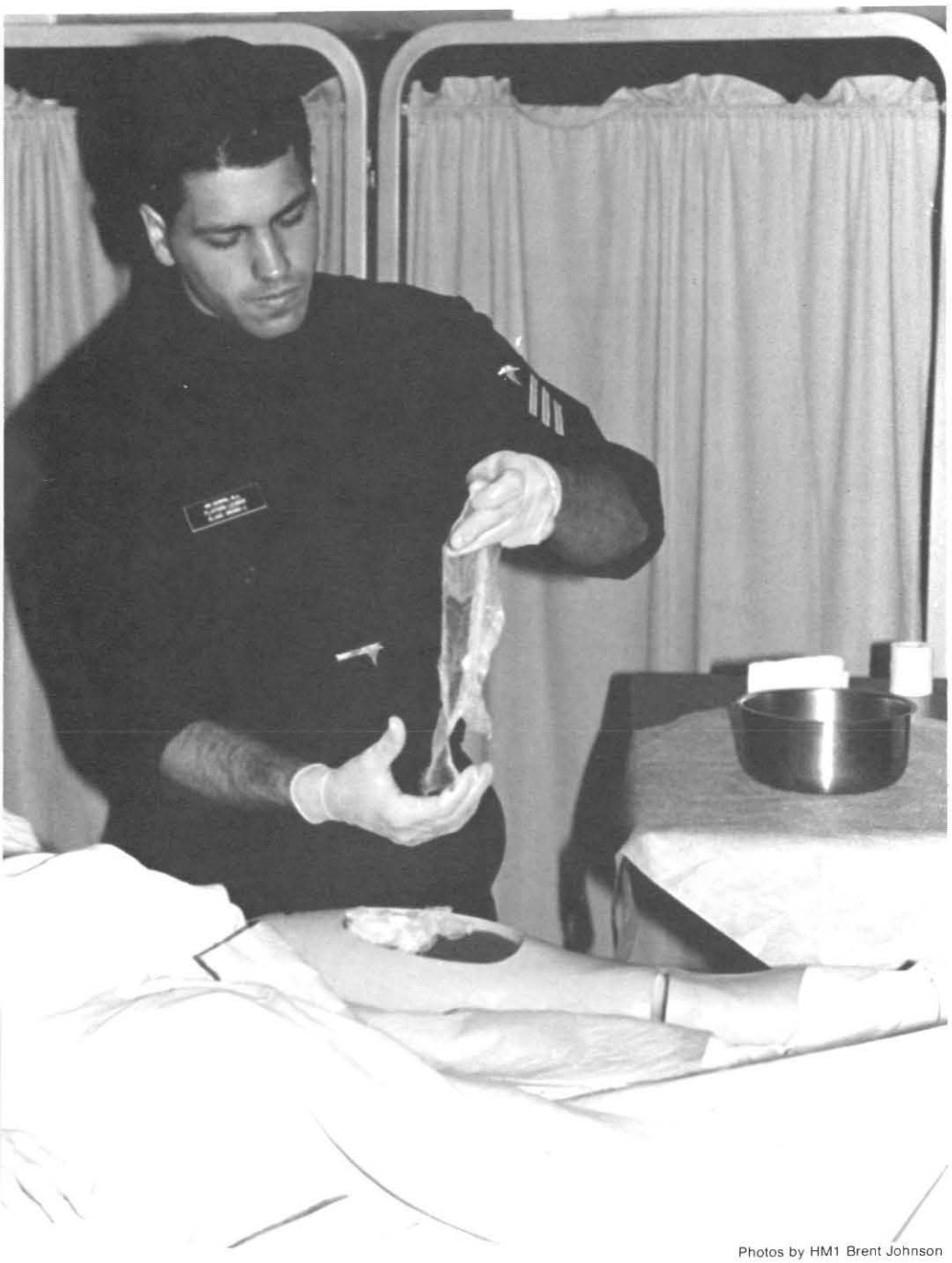
Competent hospital corpsmen must understand the purpose and impact of the procedures they perform. They must be prepared to make informed decisions on how to carry out their tasks and duties under variable circumstances. This requires an understanding of the basic sciences and theories that underlie the procedures. In addition, hospital corpsmen require "soft-skill" abilities (such as interpersonal and communications skills) that involve both cognitive and attitudinal factors in dealing with patients and other members of the medical team. The new curriculum offers this comprehensive training.

A "new look" is evident at the "A" school sites as the new curriculum begins to cause a visible change in atmosphere. The students appear to be more

Students apply cervical collar to a simulated victim prior to placing a short spine board.



At Naval Hospital Corps School ("A" school), Great Lakes, a student prepares sterile dressing for a simulated wound in the surgical asepsis lab. *Right:* HM2 Bishop explains proper IV site care.



Photos by HM1 Brent Johnson

highly motivated and are studying longer and harder. Faced with a more demanding curriculum, they are learning early on to utilize every available resource to enhance their comprehension of the more complex subject matter.

Resources such as the Computer Assisted Medical Interactive-video System (CAMIS) have proven extremely successful in helping students to grasp quickly large amounts of new information. Instructors, too, have taken on a new dedication as they work to adapt to the new curriculum and develop innovative methods of providing more advanced material.

The message is also out in the field that the new curriculum is more rigorous, requiring an increase in the ASVAB score requirement for entry from 141 to 149. Students in the new program have developed a new identity—"The First of the 490"—with a complementary change in attitude about the importance of their role as hospital corpsmen. Team spirit can be felt throughout the schools; these students know they are a necessary and vital link in providing quality patient care and are proud of it.

To ensure a smooth transition for the hospital corpsmen from the structured student role to that of patient caregiver, a follow-on training experience has been developed by HSETC. The intent of the *Clinical Practicum Phase II* (follow-on) training is to reinforce specific skills in addition to building upon the knowledge base achieved at "A" school. This planned clinical experience will provide an opportunity to integrate, augment, and strengthen the hospital corpsman's initial training.

Formal evaluation of both the curriculum and the follow-on training will also be initiated by HSETC. Feedback provided by medical treatment facilities will be shared with the "A" school sites in order to validate or revise the curriculum. In this way staff will continually maintain the accuracy and applicability of the information taught. The 14-week "A" school curriculum is truly laying the foundation for a new corpsman; one who will be better prepared to continue his/her advancement into other vital NEC's (such as Independent Duty, Laboratory Technician, or the new Advanced Care Technician) and officer programs (such as the Medical Enlisted Commissioning Program and Physician's Assistant Program). □

LCDR Bruzek-Kohler is head, Enlisted Training Programs Department, Health Sciences Education and Training Command (HSETC), Bethesda, MD 20814-5022. CAPT Schinski is commanding officer of HSETC.

Graduate Medical Education

The Cornerstone of Navy Medicine

CAPT Carol G. Reinert, MC, USN

Navy physician post-Graduate Medical Education (GME) has grown dramatically from a 2-year program emphasizing naval hygiene and military surgery at Naval Hospital, Brooklyn, NY, in the late 1800's to almost 80 GME programs at eight teaching hospitals in 1989. The programs have grown in complexity, meeting both Navy and civilian standards for accreditation, with superimposed requirements for quality assurance, supervision, credentialing, and peer review.

GME—The Role of the Naval Medical Command

Although there has always been central coordination and management of the Navy GME program, meeting the ever-increasing teaching staff, support staff, equipment, and other resource requirements of the programs in the face of operational and overseas demands (including the Vietnam conflict) has been increasingly difficult, especially in the current environment of fiscal constraint. Fragmentation of the "control" of GME programs occurred along the way, especially after the 1982 reorganization. Neither the Surgeon General nor the Commander, Naval Medical Command (COMNAVMEDCOM) was able to get timely, accurate information on the overall condition of Navy GME programs, nor were they able to implement needed changes rapidly.

In the summer of 1988 the current COMNAVMEDCOM, RADM H. James T. Sears, MC, consolidated central GME functions into a single office at the Naval Medical Command (NAVMEDCOM) with a physician in charge as his Special Assistant for Graduate Medical Education. Further consolidation of central GME management occurred in November 1988 with the incorporation of the Surgeon General's GME functions into the same special assistant's office.

The capable staffs of the training office at NAVMEDCOM (formerly MEDCOM-54) and the Health Sciences Education and Training Command (HSETC), formerly Code 2MC, were combined into the GME office (MEDCOM-00D5). Physician training other than GME, and training for other members of the Medical Department were transferred to another office (MEDCOM-53), with some of those functions remaining at HSETC along with the Clinical Investigation Program.

The special assistant and the GME office staff have ready access to COMNAVMEDCOM and the Surgeon General, so they can quickly be made aware of GME program problems and needs, and solutions can be implemented expeditiously. The first special assistant was CAPT Dick Ridenour, MC, who is now Deputy Commander, National Naval Medical Center, Bethesda, MD. The current special assistant is CAPT Carol Reinert, MC.

GME is the Navy's primary recruiting and retention tool for physicians. Beginning medical students are recruited for future service as Navy medical officers in exchange for scholarship funds and stipends. These students then compete for Navy internships (PGY-1) programs, specialty residencies (PGY-2 and beyond), and subspecialty fellowships.

Many physicians stay beyond their scholarship obligation, hoping to be selected for Navy inservice or full-time outservice (FTOS) specialty/subspecialty training. When GME programs are eroded, as has happened the last several years, the "cornerstone" is weakened, and recruiting/retention programs are no longer effective.

Selections for Navy inservice, FTOS, and Navy Active Duty Delay for Specialists (NADDS) programs are made at the Graduate Medical Education Selection Board (GMESB) each October/November. This is a duly convened selection board, and all applicants are prescreened at a separate board to assure they are administratively eligible for retention/promotion and have compatible rotation dates.

All GME program directors and command directors of medical education are brought to the Washington area to make these selections, and issues affecting programs, specialties, teaching hospitals, staffing, resources, and retention/recruiting are discussed. There are many opportunities to meet individually and in groups with the Surgeon General, COMNAVMEDCOM staff, and Medical Corps detailers. The overall mood at the November 1988 GMESB was very upbeat and optimistic, to many attendees "the best board in at least 5 years." This was a direct result of visible concern, commitment, and participation by the Surgeon General and COMNAVMEDCOM. Having one office to call for assistance with GME questions/problems has sent the message that there is a firm commitment to Navy GME.

Blue Ribbon Panel

The number one recommendation by the Blue Ribbon Panel convened by the Secretary of the Navy in the summer of 1988 was to "fix" GME. This highest level support has resulted in a much needed transfusion of resources. Morale is improving, in spite of continued physician losses projected for this summer, but it will take continued support to get "well." We are optimistic that continued implementation of the Blue Ribbon Panel recommendations will, in fact, make Navy GME and the rest of Navy medicine well.

The Future—A Winning Strategy

We have increased some of our in-service GME programs and a few new programs have been approved. Internship positions have been increased for academic year 1989 for the first time in many years. In February VADM J.M. Boorda, Deputy Chief of Naval Operations (Manpower, Personnel, and Training), and Chief of Naval Personnel, approved a significant increase in full-time outservice training billets to improve physician retention and recruit reserve physicians in civilian residencies and fellowships into the Navy. A significant number of these positions have been filled by physicians who would otherwise have left the Navy this summer, and others are being filled by newly recruited physicians.

The Armed Forces Health Professions Scholarship Program has also been increased to improve the physician pipeline. There are increasing opportunities for bonuses and special pays, even for some physicians in training. In particular, VADM Boorda recently authorized that Medical Officer Retention Bonus can be paid to otherwise eligible specialists during inservice or FTOS training. □

Dr. Reinert is special assistant for Graduate Medical Education, NAVMEDCOM, Washington, DC 20372-5120.

Highlights From Navy Medical R&D

• R&D Collaborates With MTF CIP Programs

It is now possible for the Naval Medical R&D Command to sponsor research in Navy hospitals if the work is research and development related. A collaborative effort has been developed between R&D and the Health Sciences Education and Training Command (HSETC) in Bethesda, MD. One program has already been approved and a second one is nearing approval. For further information contact the NMR&DC program office at Commercial (202) 295-1468 or Autovon 295-1468.

• Insect Repellent That Really Works

Investigators at the Naval Medical Research Unit No. 3 in Cairo, Egypt, have demonstrated that mesh clothing impregnated with the standard repellent, DEET, can effectively repel insects such as sand flies for up to 24 hours. This is important as such insects carry arboviruses and protozoal infections. The treated garment provides the additional benefits of being lightweight and cool which are essential in the 100+° temperature in the Mideast.

• White Light Is Okay in Sub's Operation Rooms

Investigators at the Naval Health Research Center in San Diego, CA, and the Naval Submarine Research Laboratory in New London, CT, have demonstrated that sonar technicians can operate as effectively in filtered white light conditions as in the traditional red light setting. This provides operators the benefit of more rapid accommodation when going to and from their sonar stations, and for making CRT colored outputs more visible. Our laboratories are currently installing the white light systems aboard submarines at the request of SUBLANT and SUBPAC.

• Thyroid Hormones Increase During Prolonged Cold Exposures

Investigators at the Naval Medical Research Institute in Bethesda, MD, have demonstrated that personnel stationed in Antarctica develop profound alterations in their thyroid hormone metabolism. More importantly, they have been able to reproduce this defect in the laboratory by repeatedly exposing volunteers to the cold in an environmental chamber. Hopefully, these observations and further studies will enable us to unravel the mystery of cold adaptation and provide insight for developing methods for our troops to adapt and perform better in cold scenarios.

For additional information on these or other medical R&D projects, contact NMR&DC Code 40 at Commercial (202) 295-1468 or Autovon 295-1468.

Payoffs of Navy Medicine

- *Kane Basin separating Greenland and Canada's Northwest Territories is named for U.S. Navy surgeon Elisha Kent Kane, one of the most famous of the 19th century's arctic explorers.*
- *In 1911 the Navy led the nation in administering antityphoid vaccinations to all its personnel. Ten years later immunization against the disease was widely practiced in the civilian community.*
- *The first experimental tetanus vaccine trials took place on the U.S. Navy hospital ship* Relief *in 1934. The war against "lockjaw" was won largely through Navy medical research.*
- *Following the entry of the United States into World War II, Navy doctors were the first to apply sulfonamides to wounds for infection prevention. Penicillin soon replaced the sulfas as the miracle drug of choice, and Navy physicians were among the first to use it for treating gas gangrene, pneumonia, and local wound infection.*
- *In 1942 Navy medical researchers developed an apparatus for the desalination of seawater for use in lifeboats and life rafts. The device was later adapted for civilian use.*
- *The concept of tissue and bone banking came about in 1949 with the establishment of the Navy Tissue Bank in Bethesda, MD. That institution is still the model for other tissue banks around the world.*
- *In 1955 Navy medical research developed a method for freezing whole blood for long-term storage. Thirty-four years later the Navy Blood Research Laboratory in Boston, MA, continues to be a leader in blood processing and storage technology.*
- *In 1958 a Navy physician found a method to treat frostbite by rapidly rewarming the affected tissues. In so doing he found that extremities which hitherto required amputation could be saved.*
- *Beginning in the mid-1940's Navy medical researchers sought a treatment for cholera, one of the deadliest diseases known. Twenty years later their work resulted in a simple oral "cocktail" that today is the standard treatment for cholera throughout the world.*

The legacy of Navy medicine is not well known and therefore not appreciated. Although the average citizen might admit that a highly specialized, battle-ready Navy requires a unique kind of medical support—hospital ships, fleet hospitals, flight surgeons, undersea medical officers, etc.—few would not be amazed at what Navy medicine has provided the health care field in general. The payoffs are many and all of us have benefited.

In this issue we begin a new series entitled "Payoffs of Navy Medicine." Each achievement could stand alone as a significant chapter in the history of medicine. Together, they represent Navy medicine's continuing tradition of service to the nation and mankind.

Conquest of Cholera

The face was sunken, as if wasted by lingering consumption; perfectly angular, and rendered particularly ghastly by the complete removal of all the soft solids . . . the hands and feet were bluish white, wrinkled as when long macerated in cold water; the eyes had fallen to the bottom of their orbs, and evinced a glaring vitality . . . and the surface of the body was cold and bedewed with an early exudation . . . .

This was a U.S. Army surgeon's terrifying description of a cholera victim in 1832. Cholera is a disease so virulent that after onset, the patient is usually dead in 1 or 2 days if left untreated. Thought to have originated in the Ganges delta, this dehydration disease hit Europe six times in the 19th century, three of which spread to the United States via infected immigrants. It is believed that these pandemics accounted for the loss of nearly 300,000 lives.

It was not until well into this century that a Navy physician developed a simple oral treatment that is now the standard cholera treatment throughout the world.

The disease is caused by the cholera vibrio organism. A byproduct or toxin of the organism attacks the intestinal wall, preventing the body from

absorbing necessary fluids and salts. With advanced cholera, a patient can easily lose up to a quart of fluid every 10 minutes because of uncontrolled diarrhea. Tissues shrink, the blood thickens to a sludgelike consistency, and vital organs eventually shut down.

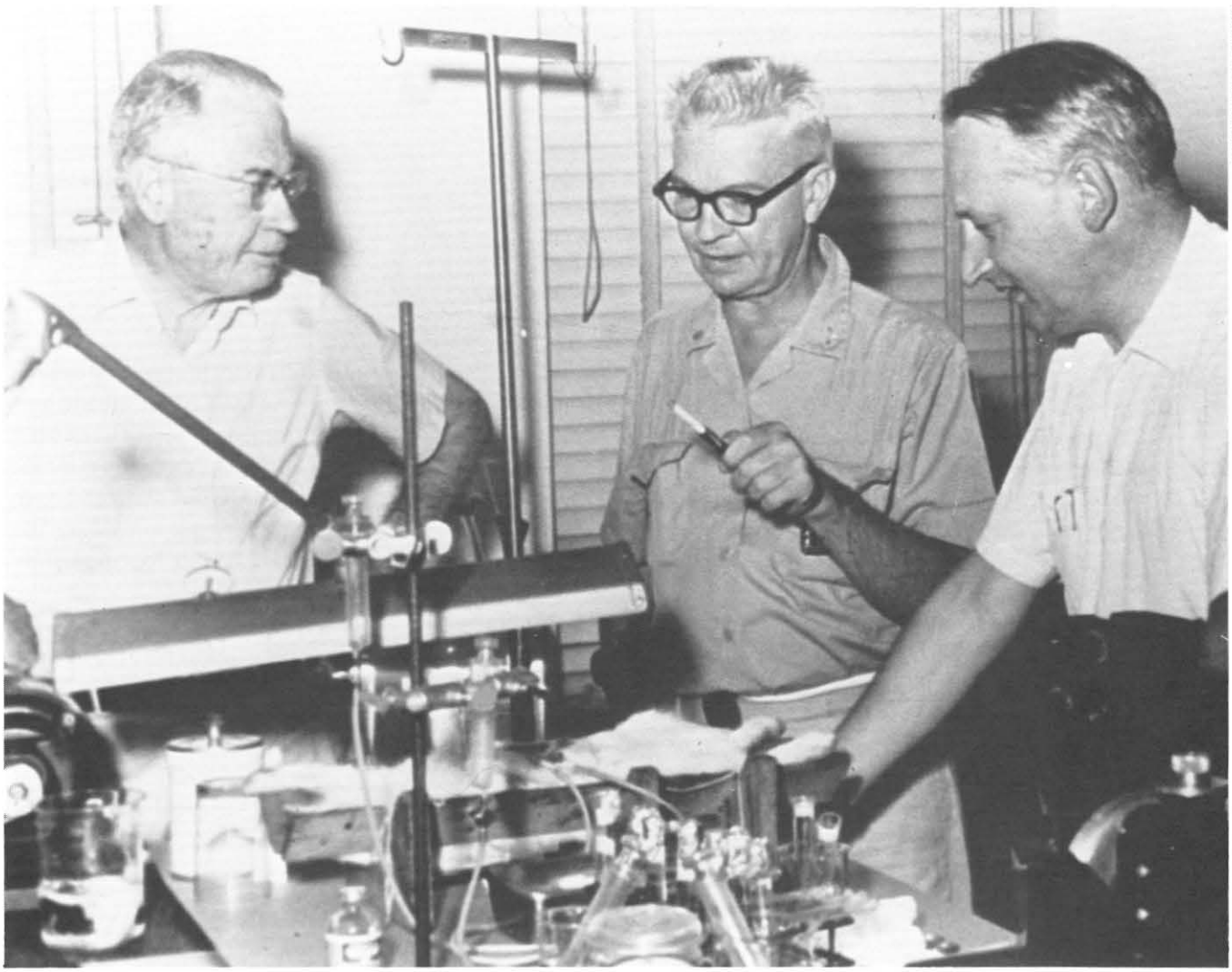
Since the latter years of the 19th century when Robert Koch's germ theory gained widespread acceptance, many attempts were made to solve the cholera riddle, but it wasn't until well into this century that CAPT Robert A. Phillips, commanding officer of the Navy's research laboratory in Cairo, NAMRU-3, approached the problem from a different perspective. He found that cholera, as deadly as it was, had something in common with the common cold. The disease was self-limiting and, provided the patient could be kept alive, cholera would eventually cure itself. The trick, Dr. Phillips found, was to treat cholera's symptoms—dehydration and diarrhea—until the disease ran its course.

In the summer of 1947 a "rogue" cholera epidemic broke out in Egypt. In less than a month the entire nation was affected with 33,000 cases and 20,000 deaths. Phillips began rehydrating his patients intravenously after determining precisely how much fluid they were losing. Immediately, the new treatment reduced the death rate to between 5 and 7.5 percent. In a disease that was almost always fatal, this was a remarkable accomplishment.

For the next 20 years CAPT Phillips and his fellow Navy researchers refined their technique, simplifying it so that health care providers with even minimal experience could save patients in undeveloped countries where cholera was endemic. The new treatment consisted of a compound rich in necessary salts (sodium chloride, bicarbonate of soda, potassium chloride) and glucose that could be prepared in advance, dissolved in water, and administered orally rather than intravenously. The cholera cocktail reduced the course of the disease to 6 hours and, with quick treatment, mortality was reduced to zero.

For his contributions to medicine, CAPT Phillips received the Albert Lasker Clinical Research Award in 1967, the only member of the U.S. armed services ever to attain this high honor. —JKH

Dr. Robert Phillips (center) and fellow researchers.



NAVMEDCOM Archives

Management Assist Teams (MAT's)

CAPT Tom Hood, USN
LCDR Susan Custis, MSC, USN

We are building a railroad
We've been given the train
We've laid 1 mile of track
And we're starting the train
cross-country tomorrow.
CDR Jan Searles, USN

We have prepared this article to provide a brief explanation of the Medical Management Assist Teams (MAT's). At the time of this writing, MAT's have been in existence for 3 months. At publication, we will be nearing completion of our brief 6-month assignment. To date, we have visited almost half the hospitals on our schedule and are motivated to share a perspective on our experiences.

In this article we have refrained from formulating summary assessments; providing such an overview would be premature. It is worth noting, however, that it is, in large measure, the personalities and dynamics of the individuals who make up these two groups that have made this a unique experience for team members and hospital staffs alike.

MAT's are two of three teams which were established as a by-product of the Medical Blue Ribbon Panel (BRP). The BRP was convened "to recommend actions that would improve access to Navy hospitals and clinics for all beneficiaries, reduce the dependency on the Civilian Health and Medical Program of the Uniformed Services (CHAMP-US), and revitalize Graduate Medical Education (GME). The objective was to achieve these results through better use of Navy hospitals and clinics, while providing the necessary capabilities to meet Navy and Marine Corps wartime medical requirements."(*1*)

In support of this objective, the Rapid Implementation Team was formed to "implement the concepts proposed by the BRP at the flagship of Navy medicine, Bethesda Naval Hospital, in order to show the resolve of the Navy establishment and to make Naval Hospital, Bethesda the model for the Navy."(*2*)

MAT's were formed to render technical assistance in support of management effectiveness by enhancing local management practices at other CONUS facilities. In all, MAT's will visit 19 hospitals.

The brief scenario presented represents the momentum of the Navy Medical Department in the wake of the BRP. MAT's as 1-short mile of track, further represent the challenge for the line and medical communities to address the issues identified in the final BRP report.

The two MAT's, totaling 20 individuals with additional clerical and contractor support, convened at the Naval Medical Command in early January. We received our unusual and challenging charge from RADM H. James T. Sears, Jr., Commander, Naval Medical Command. Although welcoming us to this project, he cautioned us that our mandate was neither to inspect nor criticize; rather, we were to "roll up our sleeves" and go out there and help.

We would take with us no offers of money nor promises of more people. We had neither mandate nor authority to implement specific change. From our varying backgrounds, we were to offer a fresh look with suggestions and assistance toward constructive change and improved managerial efficiency. The broad nature of our charter afforded us the opportunity to structure treatively our approach. As we established our methodology, we knew that we were to provide technical assistance and that the teams were developed based on this premise.

Each team consists of 10 individuals of varying perspectives. Half the team is from the Medical Department and the other half is representative of the line, supply, and civilian personnel communities. Specifically, each team considers the following areas: command issues, military manpower issues, civilian personnel matters, concerns of the enlisted community, fiscal/comptroller matters, the areas of supply and contracting, patient administration matters, management information systems, and nursing and quality assurance issues.(*3*)

Our assignment began with an intensive 4-week orientation which included briefings by various MEDCOM, OPNAV, and NMPC representatives and site visits to civilian and naval hospitals. In addition, each team member consulted subject matter experts for suggestions, ideas, "tools," and the latest information on issues which were evolving in their area.

Mindful that we are not to criticize, and concerned that hospitals not perceive the teams as inspectors in disguise, we embark with sincere intent but a degree of caution in our mission ahead. At each hospital, each team member works with our facility counterpart. It becomes an intensive week of talking and listening as we discuss problems and possible solutions. We identify barriers to problem-solving and offer a "fresh look," advice, or technical assistance, if appropriate. We identify and focus on *initiatives* and *innovations* which we export and share with other facilities, and we identify areas where higher authority may need to become involved to assist in resolving problems.

As we work, our efforts are summarized in a report provided to the hospital's commanding officer upon our departure. After the two teams have visited four to six facilities, a generic, noncommand specific report is prepared for the Commander, Naval Medical Command which discusses systemwide issues requiring headquarters involvement; however, it is a report that does not put people or hospitals "on report."

Our initial caution has long been allayed by the enthusiasm and genuine spirit of cooperation with which we were received by the hospitals. Working as a team, we continue to grow in insight and as we learn from the facilities and from each other, benefiting from the interdisciplinary collaboration in this unique endeavor.

References

1. Department of the Navy, *Report of the Medical Blue Ribbon Panel,* 21 Nov 1988, p ES-1.

2. Ibid, p 35.

3. The team members and their technical areas are as follows: (Gold) CAPT Kelsey Stewart, Team Leader and Command (Line); CAPT Will Brown, MSC, Command (Medical); CDR Jim Burnette, SC, Fiscal/Comptroller; CDR Jim Fitzsimmons, NC, Nursing and Quality Assurance; CDR Earl Beatty, MSC, Patient Administration; CDR Jan Searles, Military Manpower; LCDR Mike Gauldin, NC, Management Information Systems; LT Peggy Metzger, SC, Supply; HMCM Bill Webb, Command Master Chief Perspective; and Lynda Lane, Civilian Personnel. (Blue) CAPT Tom Hood, Team Leader and Command (Line); CAPT Fred Sanford, MC, Command (Medical); CDR Dick Lyman, Fiscal/Comptroller; CDR Kate Smith, NC, Nursing and Quality Assurance; LCDR Susan Custis, MSC, Patient Administration; CDR Monica Mitchell, Military Manpower; LCDR Mike Saunders, MSC, Management Information Systems; LCDR Ed Tynan, SC, Supply/Contracting; HMCM Dave Krebs, Command Master Chief Perspective; and Paula Bickham, Civilian Personnel. □

CAPT Hood is Team Leader (Blue) and LCDR Custis is Patient Administration Representative (Blue) of the Medical Management Assist Teams.

In Memoriam

Our Fallen Shipmates of USS *Iowa*

Occupational Medicine Aboard USS *Kitty Hawk*

From Fortress to Factory

LCDR Lawrence Stilwell Betts, MC, USNR
CAPT C.W. Wickham, MC(FS), USN
CDR Jesse Dunn, MC(FS), USNR
LT John S. Class, MSC, USN

USS *Kitty Hawk* (CV-63) was commissioned in 1961 at the New York Shipbuilding Corporation in Camden, NJ. During her first quarter-century of naval service, she proudly displayed the ensign over her 1,065-foot length and 80,000-ton displacement while steaming across hundreds of thousands of miles on distant seas.

Under the command of CAPT F.L. Tillotson, *Kitty Hawk* has relinquished, only temporarily, her role as a floating fortress—a bastion and safe haven for the aircraft and "brown shoes" she carries; she has become the centerpiece of industry on dry land in the City of Brotherly Love—Philadelphia. Her space-age technology has been exchanged for the heat-darkened tools of the foundry, the remotely-guided weapons for hand-held grinders, and the sharply polished shoes for steel-toed "boondockers." *Kitty Hawk* is being reborn into her second quarter-century.

Kitty Hawk entered the Philadelphia Naval Shipyard on 3 July 1987 to undergo a substantial repair, restoration, and renovation under the Service Life Extension Program (SLEP). Together with the obvious changes that occur when a carrier enters a shipyard for an extended period, such as loss of the aircraft and associated personnel, *Kitty Hawk* was also transformed in another significant way. The captain, executive officer, department heads, officers, and every member of the crew became industrial managers and workers. In addition to the knowledge and skills essential to operating the ship at sea, new talents were needed in order to meet the requirements for the ship's force work.

USS *Kitty Hawk*

PH3 Martens

The primary consideration was readying the ship for restoration and renovations by removing the items which were her first quarter-century's treasures (the Scoop phase); providing fire-watches during "hot work" to ensure that conflagration did not follow the simple torch removal of a metal bracket; manning and continually drilling a nucleus fire party in anticipation of that feared shipboard fire; refurbishing the seemingly countless valves, pipes, and wiring bundles; grinding, chipping, and sanding the layers of protective coatings from metal surfaces; renewal of equipment through rebuilding and restoring metal surfaces; and numerous other industrial tasks. The medical department recognized the need to adapt its preventive medicine program to meet the requirements of these new occupational exposures.

KHOMSP

The *Kitty Hawk* Occupational Medicine Surveillance Program (KHOMSP) was conceived with the knowledge that exposure of personnel to significant or excessive levels of chemical or physical agents could result in harm. Although it would have been desirable to perform industrial hygiene sampling to quantify exposure of personnel to various agents found within the industrial environment, often this was not practical or feasible.

In those instances, a pre-exposure judgment was made as to the specific safety and health requirements necessary for performance of a task. Based upon chemical and physical exposures known to be present during the industrial operations, determinations were made regarding the need for local

PH2 H. Johnson

High and dry, *Kitty Hawk* await's below-the-waterline maintenance.

exhaust or general ventilation, the requirement for respiratory protection and other personal protective devices, the requirement for barriers or other environmental control measures, the need for administrative control measures to limit exposure, and the need for a baseline physical examination and evaluation.

Using DODINST 6055.5-M, as well as Chief of Naval Operations instructions, target programs were established for the following potential exposures: asbestos, chromium (VI) salts, hearing conservation, heat stress, insulation workers, lead, nonionizing radiation, organophosphates, respiratory protection, and solvents.

Each individual aboard the ship during the first year of the SLEP period received a physical examination. This exam sought to identify biological changes associated with exposure to the hazards anticipated on each individual's working environment. This was a significant endeavor, as over 2,000 men came through the medical department for a physical. The exam included an organ system review, occupational history questionnaire, and appropriate laboratory, radiologic, spirometric, electrocardiographic, and audiologic evaluations.

Because these exams were performed in addition to the routine duties of medical department personnel, as well as the routine duties of those "industrial personnel" who were being evaluated, this initial phase of KHOMSP took approximately 5 months. Additionally, all new personnel reporting aboard were also placed in KHOMSP during their "I Division" indoctrination period.

Lead Surveillance (KHOMSP/Pb)

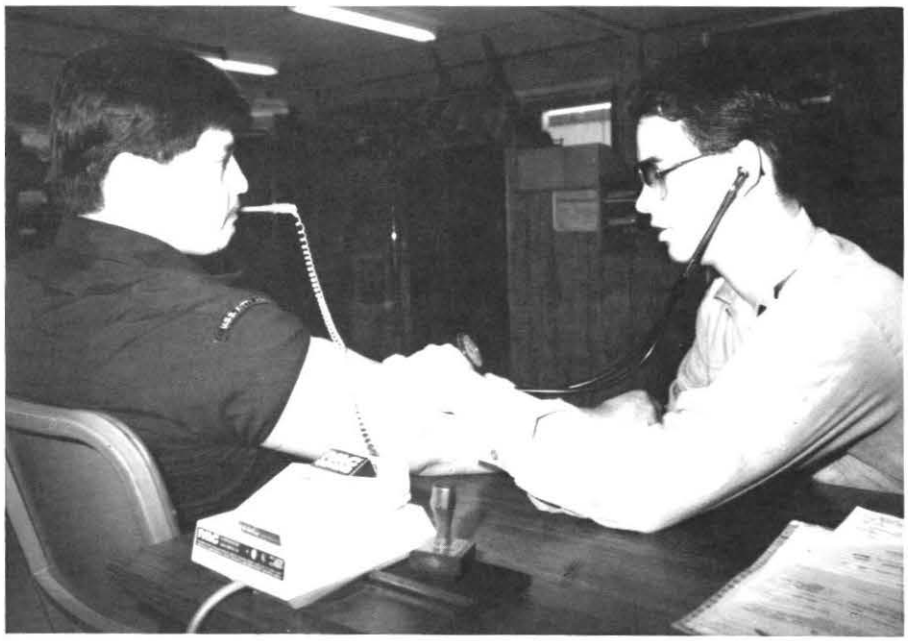
All industrial personnel were placed in the Occupational Medicine Surveillance Program for Lead (KHOMSP/Pb) and Hearing Conservation (KHOMSP/HC). As a minimum, these personnel received a pre-exposure for lead that included a baseline or current monitoring audiogram.

It was well known that lead-contaminated dust is a product of chipping, grinding, and sanding operations on surfaces coated with lead-based paints. The removal of surface coatings, including paints with variable concentrations of lead in the dry product, was a massive component of the overall restoration and renovation.

The decision to include all personnel in this program was based upon several factors. One was the expected "significant potential for exposure" to airborne dust containing lead and the varying concentration of lead in paint. Another was the inability to physically sample and evaluate each individual's daily exposure as one of hundreds of industrial personnel, working in one of hundreds of compartments comprising tens of thousands of square feet of painted surfaces.

Lead exposure could result from direct inhalation of the dust, inhalation of the dust transferred from contaminated hands to smoked tobacco products, swallowing or ingestion of dust when eating food, or the dust actively brought to the mouth through poor personal hygiene or nail-biting habits. Additionally, the lead in lead-based paints could be volatilized and inhaled during "hot work," such as torch-cutting or welding.

The baseline physical exam for lead included the basic physical with attention to all organ systems, including the reproductive system; a questionnaire for respirator use; specific occupational, environmental, and avocational histories with respect to previous or present lead exposure; and a baseline blood lead (PbB) concentration and zinc protophorphyrin (ZPP) concentration. During the exam the hazards of lead were discussed and later reemphasized during division-level safety training.



HN Kurt Schwiedop examines crewmember. *Left:* HM3 James Hardy prepares to obtain blood specimen for lead and zinc protoporphyrin levels as part of the medical surveillance program.

Recall, Reevaluate, Reeducate, and Remove

During the preplacement screening of personnel for baseline PbB and ZPP concentrations, no one exceeded the OPNAVINST 5100.23B requirements for removal from exposure to lead and additional surveillance. There were, however, four individuals who had previously commenced working on the removal of lead-based paints and who had blood lead concentrations over the action level (30 mcg/dl) prescribed in OPNAVINST 5100.23B.

As required by that instruction, these personnel were *recalled* to the medical department for *reevaluation.* Each was *reeducated* with respect to the possible routes of exposure to lead (such as poor personal hygiene and failure to comply with respiratory protection requirements) as well as nonoccupational routes (drinking acidic beverages from containers with leaded glazes or paints and exposure during off-duty employment). Potential nonoccupational routes were discussed and evaluated.

Whenever possible, the individual's respirator and clothing were examined for the presence of gross paint-dust contamination. The investigators discovered that the inside (facial contact area) of the respirators were almost universally contaminated with paint dust. A significant source of the dust arose from the practice of storing the respirator by literally "wearing" it strapped on the upper thigh of dirty coveralls or dungarees! This practice has since been discouraged. Poor personal hygiene (failure to wash both hands and face before eating) and failure to adhere to respirator use requirements have been identified as additional causal factors in cases of elevated blood lead concentrations.

The individual was *reevaluated* with a detailed physical exam directed at systems which could possibly exhibit signs of lead toxicity: cardiovascular, nervous, musculoskeletal, gastrointestinal, reproductive, as well as the skin (gums). Blood was drawn for the determination of the complete blood count, red blood cell indices and morphology, creatinine and blood urea nitrogen determinations, and PbB and ZPP concentrations. A chest radiograph (PA) and a urinalysis with microscopic examination was obtained.

Lastly, the OPNAV instruction required the *removal* of the individual from exposure to lead until two successive blood lead determinations were below 30 mcg/dl. A letter informing the individual, his department head, the safety officer, and the commanding officer was sent recommending the removal and medical surveillance in accordance with the OPNAV instruction.

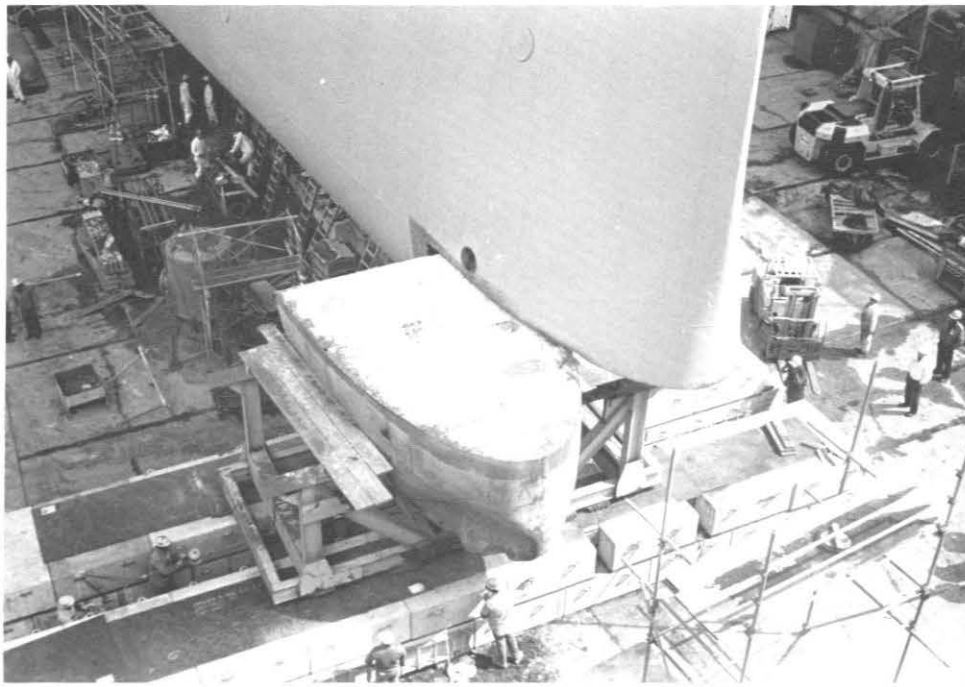
Recall, Reeducate, and Reevaluate

Kitty Hawk established an additional awareness and prevention aspect to KHOMSP/Pb in order to identify and reinforce the education of personnel at risk of removal from exposure to lead. When an individual had an initial baseline or a monitoring PbB concentration in the range of 20-29 mcg/dl, he was *recalled* for *reeducation* and *reevaluation.* Proper use and care of personal protective devices, personal hygiene, good work practices, and the hazards associated with excessive exposure to lead were again addressed. Monitoring PbB and ZPP concentrations were obtained in order to identify a trend.

Other Target Programs

As mentioned above, KHOMSP/Pb was only one program of several separate target programs initiated prior to the SLEP period. The other target programs had similarly prescribed physical examinations and evaluations. In some instances specific requirements had not been promulgated to the extent of the above discussed lead program or the well-known Asbestos Medical Surveillance Program. For the other target programs, the DODINST 6055.5-M of July 1982 was used to establish the basic physical examination and evaluation requirements.

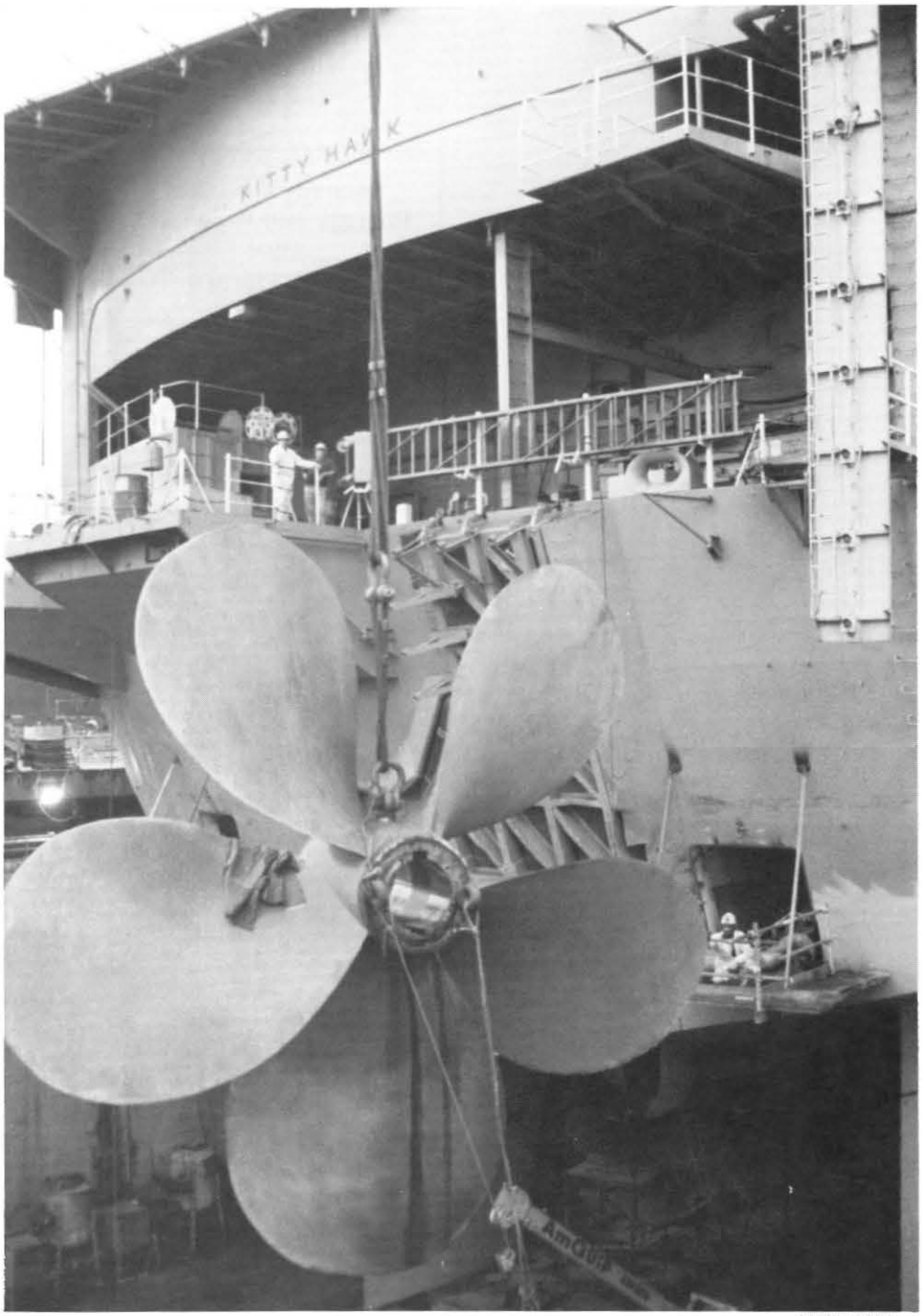
Additional guidance was obtained using information from other naval instructions and publications dealing with occupational medicine, such as OPNAVINST 5100.20C of 5 March 1985 for Shipboard Heat Stress Control and Personnel Protection and NAVMED P-5010-3 of 1988 for Ventilation and Thermal Stress Ashore and Afloat. The Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and assorted occupational medicine and industrial hygiene texts were also consulted. In all instances the health of the individual crewmember was paramount and every effort was made to ensure the continued well-being of personnel with the attainment of realistic productivity goals.



During "Team Spirit '84," *Kitty Hawk* was struck by a submerged Soviet "Victor" class submarine while operating in the Sea of Japan. Photo shows cut-out forward section of bow being removed. *Right: Kitty Hawk* personnel manually remove a catapult steam cylinder.

As an example of the interplay between different target programs, an important and potentially critical situation occurred with the attempt to meet separately mandated requirements involving removal of lead-based paint on hot days. Personnel were required to wear coveralls (Tyvek) when engaged in grinding, chipping, or sanding operations. This prevented the transfer of lead-laden dust to underlying work clothes and prevented the evaporation of sweat and convective cooling. It also created a heat stress environment within the internal micro-environment of the Tyvek coveralls which was difficult to monitor and assess. At elevated outside temperatures, a 100 percent humidity condition could exist next to the body with no possible means to reduce the body temperature utilizing the movement of air.

Additionally, the wearing of a respirator, especially a fullface respirator, would further limit the body's ability to lose heat by covering and insulating the facial area. Recognizing this condition, *Kitty Hawk* adopted a liberal rest:work cycle during periods of high ambient temperatures (greater than 90° F) and independent of the environmental relative humidity. During the first summer the Delaware Valley experienced an unusually hot and dry period lasting several months. Under such a liberal rest:work regimen, *Kitty Hawk* accomplished and actually exceeded all the ship's force work goals with no heat-related casualties.



PH2 Matt Wilson

One of *Kitty Hawk*'s props is removed for refurbishment.

Comments on KHOMSP

The laboratory determinations of the PbB and ZPP concentrations, provided through the support of Mr. George Lindsay and other dedicated chemists at the Industrial Hygiene Laboratory, Navy Environmental and Preventive Medicine Unit Number Two, Norfolk, VA (formerly the Industrial Hygiene Laboratory, Navy Environmental Health Center), have been important aspects of this program. The guidance for the application of the PbB concentration in the disposition and medical surveillance of personnel is addressed in OPNAVINST 5100.23B, change 3 of 28 July 1987. The application of the ZPP concentration is not specified.

From a toxicological standpoint, it is known that the inhibition of heme synthesis by lead causes a gradual elevation of ZPP over a period of months whereas the blood lead concentration rises more quickly after an acute exposure. The ZPP concentration gradually returns to within normal limits over a period of months and the PbB decreases more rapidly. Therefore, the PbB determination has more significance in the early period following an acute exposure or at any time during a frequently repeated, or chronic exposure.

The ZPP determination has application in the assessment of the late period (months) following an acute or intermittent exposure or in a chronic exposure situation. When evaluated together, PbB and ZPP concentrations can aid the physician in the assessment of the severity and outcome of an exposure, and the need for, and efficacy of, therapeutic intervention.

As of January 1989, 27 men have been temporarily removed from exposure to lead in accordance with the requirements of the OPNAV instruction. None exhibited symptoms or had signs of lead toxicity. None required chelation therapy. Although the entire crew was initially screened for potential exposure to lead, only 870 remained in the program as "lead workers" at the 6-month surveillance point.

There have been few additional instances where the medical department has recommended the removal of an individual from his assigned work space for reasons associated with occupational exposures. In each case, the cognizant department or division has assisted with the reassignment of the individual to an acceptable position. It is only in a setting of mutual cooperation between the medical staff and line management that such a complementary arrangment can prosper to the advantage of the crew and the Navy.

The Navy's Occupational Medicine Program as promulgated in DOD and OPNAV instructions and implemented by *Kitty Hawk* works and is effective in maintaining productivity while assuring the continued health of naval personnel. □

LCDR Betts is general medical officer, CAPT Wickham was senior medical officer, CDR Dunn is senior medical officer, and LT Class is medical administrative officer of USS *Kitty Hawk*.

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